

A review of the distribution and population of the Collared Crow *Corvus torquatus*

PAUL J. LEADER, DAVID J. STANTON, RICHARD W. LEWTHWAITE & JONATHAN MARTINEZ

Abstract: The Collared Crow *Corvus torquatus* is a species largely restricted to China and is currently listed as Near Threatened. This paper reviews historical changes in the distribution of Collared Crow in China and, based on modern records from China, Vietnam and Taiwan, provides the first systematic global population estimate for the species. Based on field surveys in Guangdong province, China, during 2003–2014, evidence is presented that shows it is absent from vast areas of habitat suitable for the species in that province and indicates that a previous population estimate made in 2007 by BirdLife International, based on an extrapolation of numbers from one of its strongholds in Hong Kong, is flawed. A revised population of less than 2,000 individuals is substantially less than the 15,000–30,000 previously estimated, and it is recommended that the species be uplisted to Vulnerable.

INTRODUCTION

The Collared Crow *Corvus torquatus* is found mainly in the People's Republic of China, being resident in the south and east, reaching southern Hebei in the north-east, Gansu in the west and Yunnan and Hainan in the south-west (Cheng 1987, BirdLife International 2016). Outside mainland China, it is known only from northern Vietnam and Taiwan, where it is restricted to Kinmen Island (just off the coast of mainland China) and the main island of Taiwan, where it is accidental (Brazil 2009, BirdLife International 2016). It is currently listed as Near Threatened on the basis that the global population is experiencing a moderately rapid and ongoing decline (BirdLife International 2016).

This paper reviews the historical distribution of the species and presents an up-to-date summary of its distribution and population.

METHODS

Historical literature review (1855–1980)

The authors carried out an extensive review of the historical literature (including Chinese ornithological literature) on the distribution and population of the Collared Crow in China from 1855 to 1980, commencing with Robert Swinhoe's first records from China to the end of the period covered by Cheng (1987).

Review of recent records (2003–2014)

Records of Collared Crow for the period from 2003 to 2014 were collated. These were sourced from the published literature; from online requests for records from Birdforum (<http://www.birdforum.net/showthread.php?t=288068>), ChinaBirdnet.com and Oriental Birding (orientalbirding@yahoo.com); from online databases BirdTalker (<http://birdtalker.net>) and eBird (<http://ebird.org>); and from direct requests for information. Where necessary, observers of online records were contacted to request permission to publish their data. If this could not be obtained such records were summarised and the reader is referred back to the original source. Where a number of birds was given as a range (e.g. 10–20), the lower figure was used. From these records the highest count from each site was taken and these were summed to arrive at a total population estimate.

Surveys in Hong Kong, Macau and Guangdong province

Field surveys were carried out in the Hong Kong Special Administrative Region (hereafter Hong Kong), the Macau Special Administrative Region (hereafter Macau) and Guangdong province during the period 2003–2014; additional data were sourced from other reliable observers. Surveys were carried out using a 5 × 5 km

square grid based on that used for Hong Kong (see Carey *et al.* 2001). Within each square a minimum of two hours continuous observation was spent in suitable habitat. The Collared Crow is known to prefer low-lying areas, and shows a very strong association with wetlands including agricultural areas (particularly rice fields), riverine plains, lightly wooded country near water or marshes, fishponds and coastal areas (including mudflats, rocky and sandy shores). It generally avoids more heavily wooded or hilly country and developed areas such as parks, gardens and towns (Madge & Burn 1994, Carey *et al.* 2001, Carey 2009, BirdLife International 2016, Madge 2016). The survey methodology was fluid to allow for differences in terrain and infrastructure, but generally followed roads and paths with prolonged scans of open country, estuaries, beaches and mudflats as required. Areas of potentially suitable habitat were identified through a combination of local knowledge, a review of maps and/or aerial images, and cold searching. Although the survey period was long (12 years), which could potentially lead to an over-estimate of the number of individuals present, given the low numbers recorded during the surveys any over-estimate is not considered significant.

RESULTS

Historical literature review (1855–1980)

The Collared Crow was formerly common and widespread on the coast and in the lowlands throughout much of southern China, south to Hainan and west to central Guangxi; its distribution also extended north to Beijing and west to northern Shaanxi, west Sichuan and eastern Yunnan (Appendix 1). Armand David, who travelled widely in the north, west and south of China between 1862 and 1874, considered it 'one of the most characteristic birds of the Chinese avifauna ... particularly widespread in southern provinces ... sedentary' (David & Oustalet 1877).

Other authors who provided first-hand accounts of the species in southern China between the 1850s and 1930s also regarded it as resident and without exception used terms such as 'common', 'very common', 'frequently occurs', 'often met with', 'abounds', 'large numbers' or 'assembling by the hundreds' when describing its abundance. The localities referred to included Xiamen, Fujian, in the 1850s (Swinhoe 1860); Hong Kong, Guangzhou and Macau in 1860 (Swinhoe 1861a); the lowlands of north and north-west Hainan in 1868 (Swinhoe 1870); the entire Lower Yangtze basin from eastern Hubei to the delta in the 1880s (Styan 1891); Fuzhou and Shantou on the Fujian–Guangdong coast in the 1880s and 1890s (La Touche 1892, Streich 1903, La Touche & Rickett 1905); Zhenjiang, Jiangsu in the early 1900s (La Touche 1906–1907); Hong Kong, Macau, the Pearl River Delta, the

North River north to Shaoguan, and the West River from the Pearl River Delta through western Guangdong to central Guangxi in the years 1900–1908 (Vaughan & Jones 1913); Shasi, Hubei in 1917–1919 (La Touche 1922); Jiangsu and Anhui south of the Yangtse in 1921–1922 (Koltoff 1932); the lowlands of Guangxi in the years 1927–1931 (Yen 1933–1934); Nanjing, Jiangsu in 1930 (Ascherson 1930); Zhejiang in the early 1930s (Shaw 1934) and north and south-west Guangdong in the early 1930s (Yen 1932, Jabouille 1935). The above accounts paint a consistent picture of a common and widespread species.

Its abundance on the South China coast and along the Yangtse was not matched at Shanghai, where it was only found occasionally (Sowerby 1943). North of the Yangtse River, it was recorded in Beijing in 1860 and 1900–1901 (Swinhoe 1861b, 1863, Walton 1903), Sichuan in 1868–1869 (David 1871), Hebei at least up to the 1920s (Wilder & Hubbard 1924), Shandong in the 1920s (LeFevre 1962), Henan in the 1930s (Fu 1937), Shaanxi in 1957–1958 (Cheng *et al.* 1962), and on unknown dates in Shanxi, Gansu, Guizhou and north-east Yunnan (Cheng 1987). Except in Henan, where Fu (1937) stated that it was common on the plains, it was generally considered to be much less common in the north of its range than in the south.

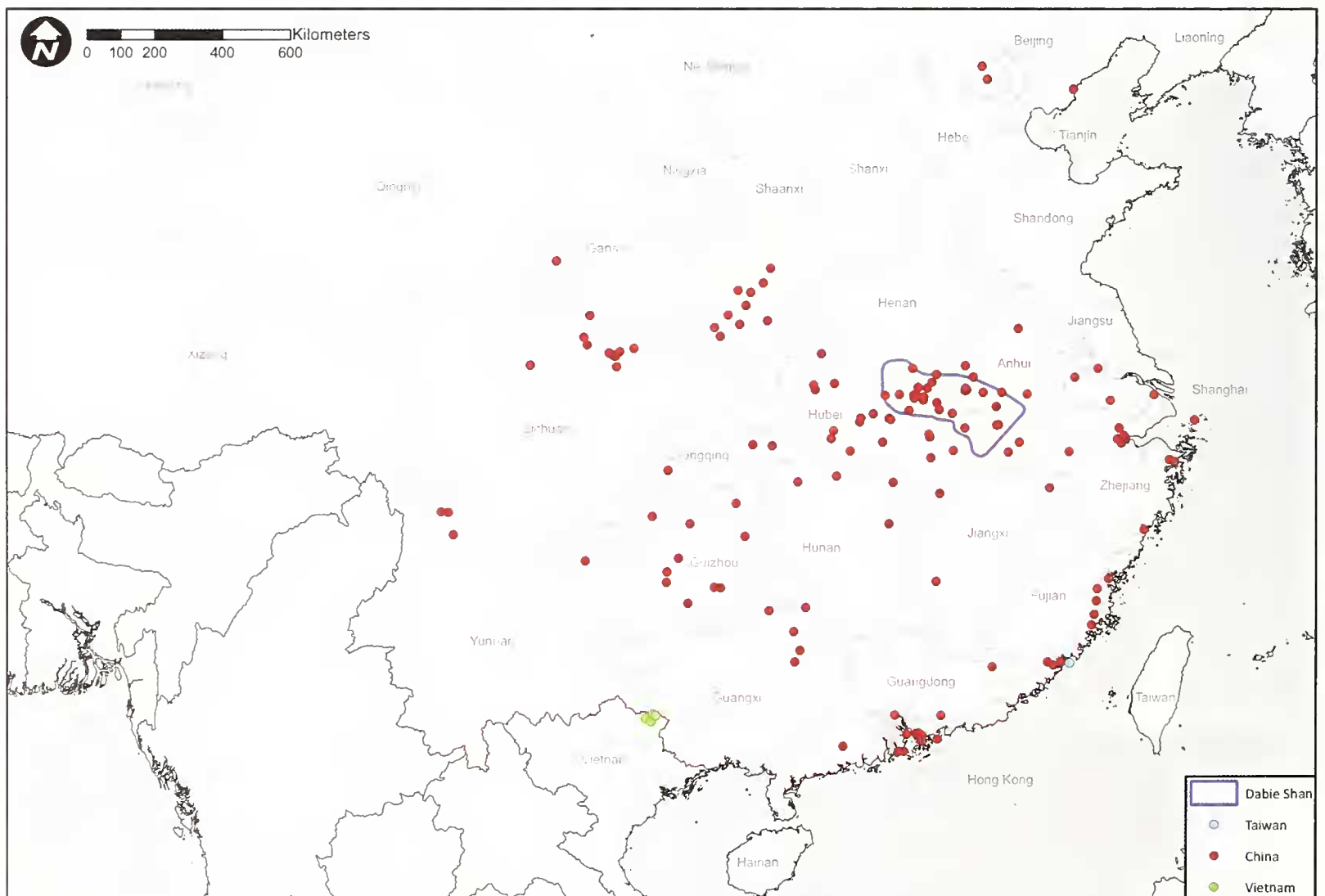
In the late 1950s, when the study of birds resumed following a period of invasion and civil war, ornithology in China was largely concerned with ascertaining whether a particular species was harmful or beneficial to farming and forestry, and the status and distribution of the Collared Crow was much less clear. However, the fact that the stomach contents of 63 Collared Crows were analysed in one study alone in Fujian in 1957 (Cheng 1963), indicated that the species was still present in good numbers locally in China in the late 1950s.

Review of recent records (2003–2014)

Records were collated from mainland China, Taiwan and Vietnam for the period 2003–2014. The peak count from each individual site was taken and summing these counts provides population estimates of 1,709 individuals for China, 18 for Taiwan and 120 for Vietnam, a total of 1,847 individuals. The locations of records are shown in Figure 1 and summarised in Table 1 and a detailed breakdown of the records is provided in Appendix 2. The provinces/municipalities in China with the largest populations were Henan (451 individuals), Hong Kong (362), Hubei (223), Anhui (170) and Zhejiang (146). In Taiwan it was restricted to Kinmen Island (about 25 km east of the coast of mainland China) with a population estimate of 18 individuals. In Vietnam 120 individuals were reported from Cao Bang province.

The distribution pattern broadly matches that in the published literature, covering an area of 2,400,000 km² (excluding isolated records from Beijing and Hebei which were considered by the observers to be wandering individuals). Of particular note were the numbers from the Dabie Shan in central China. Large numbers were reported from Shangcheng, Gushi and Huaibin counties, Henan province, between 4–10 December 2014, with an estimated 400–500 individuals in a total of more than 7,000 crows, including Carrion Crow *C. corone*, Large-billed Crow *C. macrorhynchus*, Daurian Jackdaw *C. dauuricus* and Rook *C. frugilegus*. Interviews with local villagers revealed that Collared Crows were very common in the area (Henan Wild Bird Society *in litt.* 30 January 2015). The Dabie Shan range covers Henan, Hubei and Anhui provinces (Figure 1) and Liu *et al.* (2008) listed Collared Crow from all three areas during 2004–2006. Based on the data presented here, 525 birds were recorded in the Dabie Shan—Henan (412), Hubei (109) and Anhui (4). These records indicate that the Dabie Shan

Figure 1. The distribution of Collared Crow records 2003–2014 (the main stronghold in the Dabie Shan is outlined).



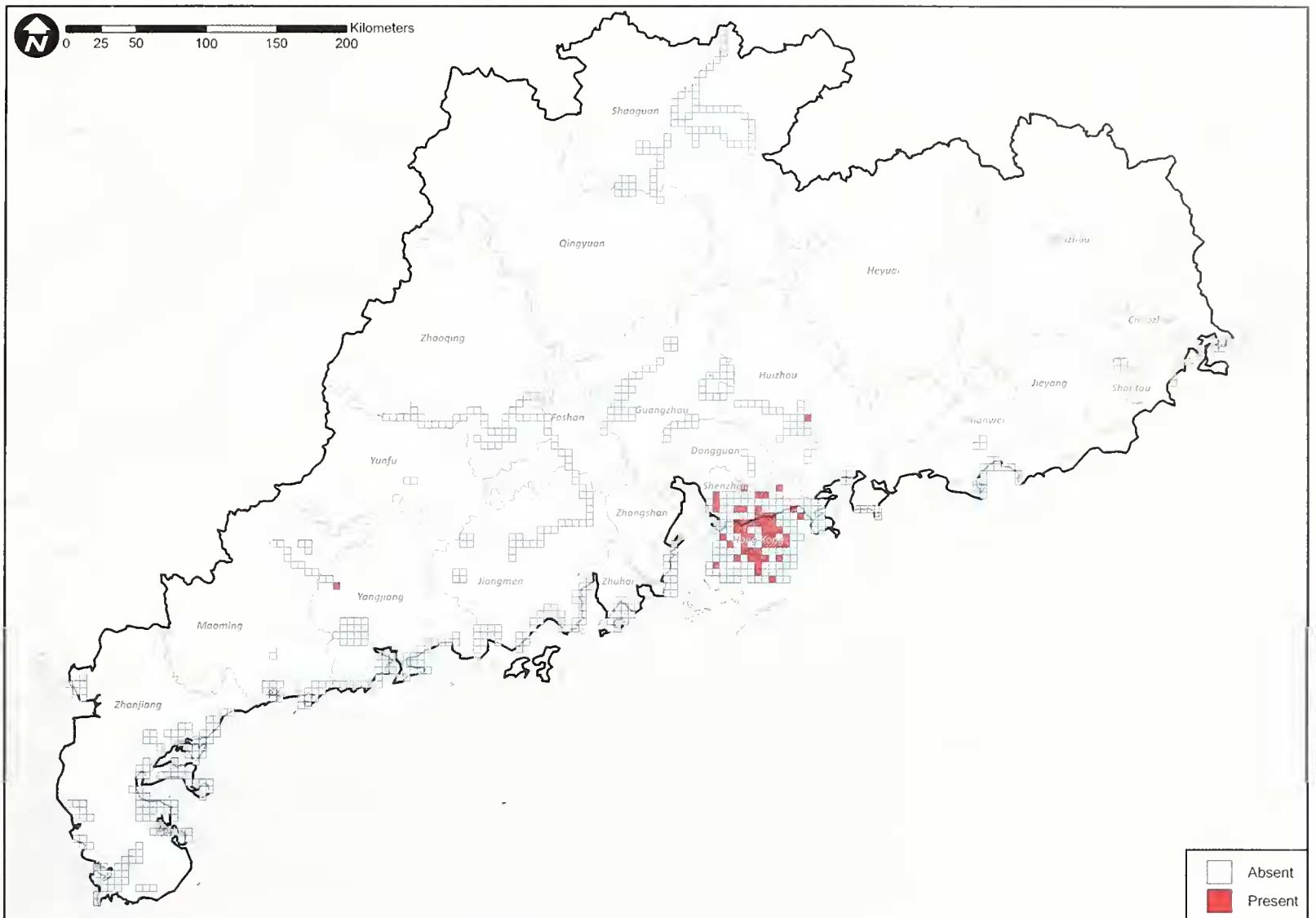


Figure 2. The distribution of Collared Crow records in Guangdong, Hong Kong and Macau 2003–2014 (the grid is 5 km × 5 km and the presence or absence of Collared Crows is shown).

is currently the most important stronghold for the species with about 30% of the total population, followed by Hong Kong with about 20%.

Surveys of Hong Kong, Macau and Guangdong province

In total 714 squares (5 km × 5 km) were surveyed in Guangdong (605), Macau (3) and Hong Kong (106). Of the 21 prefectures in Guangdong province 17 were surveyed, and 9% of all squares in Guangdong, Macau and Hong Kong were surveyed. The results of the surveys are summarised in Table 2, and the squares surveyed shown in Figure 2. In Guangdong the species was recorded from 12 squares, of which 10 were in Shenzhen (immediately to the north of Hong Kong) and the others were from Yangjiang county (four individuals) and Huizhou county (a single bird). Records in Shenzhen and Huizhou county came from large reservoirs surrounded by orchards or shrubland. The four birds in Yangjiang county were on a small cultivated plain with extensive rice fields. The plain itself was surrounded by low (100–300 m) hills, mostly covered by shrubland and small orchards. It is noteworthy that such habitats were regularly encountered in other areas, but no Collared Crows were found.

In Hong Kong it was recorded from 38 of the squares surveyed, and there were no records from Macau.

DISCUSSION

The findings presented here give a clear picture of the decline of the Collared Crow. The current situation in Guangdong province, where it was once clearly much more common and widespread (see

Appendix 1), is indicative of a major decline in both abundance and distribution. There are clear indications of similar declines in other provinces, notably Chongqing, Fujian, Hainan (where it was last recorded in 1963), Hebei, Jiangsu, Macau and Shaanxi. There are no recent records from Shandong, Shanghai, Shanxi and Tianjin, hence, although the historical literature suggests it was never common in these provinces, this would indicate a reduction in the range of the species.

The revised population estimate presented here of less than 2,000 individuals is substantially lower than the current population estimate of 15,000–30,000 individuals (BirdLife International 2016). This estimate was largely based on the assumption that its distribution and abundance in Hong Kong is mirrored across the rest of its range (S. Chan *in litt.* 2007, BirdLife International 2016), and whilst it could be argued that there are populations which remain to be discovered, given that this is a large, readily identifiable, open-country species it is considered untenable that a further 13,000–28,000 have been overlooked. In Guangdong it was recorded in 12 (2%) of 605 squares surveyed, with 15 individuals recorded, whereas in Hong Kong 362 individuals were recorded in 38 (36%) of 106 squares surveyed. Large areas of Guangdong not surveyed consist of extensive tracts of habitat unsuitable for this species and, although not included in the surveys described here, the hills and forests of Guangdong are relatively well surveyed and there are very few records from these areas. In a comprehensive review of birds at nine forest sites in south-east China between 1984 and 1996, Lewthwaite (1996) reported the species from only one site, Ba Bao Shan, in Guangdong, where up to three were seen at 600 m on two dates in June and December. This situation was confirmed by Lee *et al.* (2006) who did not record Collared

Table 1. Summary of all records of Collared Crow during the period 2003–2014.

The list of provinces and municipalities includes all those with historical records.

Historical status: * uncommon; ** uncommon to common; *** common to very common

Province/Municipality	Total number	% of total
Mainland China		
Anhui***	170	9.2
Beijing*	2	0.1
Chongqing***	15	0.8
Fujian***	71	3.8
Gansu*	20	1.1
Guangdong***	29	1.6
Guangxi***	86	4.6
Guizhou*	22	1.2
Hainan***	–	–
Hebei**	1	0.1
Henan***	451	24.4
Hong Kong***	362	19.6
Hubei***	223	12.1
Hunan*	9	0.5
Jiangsu***	8	0.4
Jiangxi*	12	0.6
Macau***	3	0.2
Shanxi*	–	–
Shandong*	–	–
Shanghai*	–	–
Shaanxi*	48	2.6
Sichuan**	25	1.4
Tianjin*	–	–
Yunnan*	6	0.3
Zhejiang**	146	7.9
Taiwan		
Fujian	18	1.0
Vietnam		
Cao Bang	120	6.5
Total	1,847	100.0

Crow in surveys of 54 forest areas in southern China, including Guangdong. More significantly, Zou & Ye (2016), in a review of all historical records for Guangdong province, listed it from only 15 locations: Guangzhou, Shaoguan, Shenzhen (four sites), Zhuhai, Shantou, Zhaoqing, Huizhou, Meijing River, Heyuan, Yangjiang, Qingyuan and Yanfu City.

It is of note that in contrast to the Collared Crow, the Large-billed Crow remains a common and widespread species in Guangdong province (pers. obs.). This is thought to be due to differences in habitat preference, with Large-billed Crow found mostly in hill forest whereas Collared Crow occurs largely in the lowlands, which inevitably brings it close to human habitation, thus making it more vulnerable to persecution and secondary poisoning.

Corvid populations typically include a proportion of non-breeding birds and, whilst the breeding ecology of Collared Crow is little-known, studies of similar species such as Carrion Crow and American Crow *C. brachyrhynchos* indicate that breeding commences when birds are two years old and that a high proportion of the populations of both species are non-breeding birds (Roselaar 1994, McGowan 1997). Estimates of the proportion of non-breeding birds in Carrion Crow populations include 77% in Sweden, 50–73% in Scotland and 40% in France; however, the proportion of non-breeding birds could be even higher than this as non-breeding birds are known to form scattered flocks and even hold territories (Roselaar 1994). Detailed surveys at a roost at Mai Po Nature Reserve, Hong Kong, indicate that between 49–91% of the population remain in communal roosts over the breeding season (Stanton *et al.* in prep.) and are therefore presumably non-breeding birds.

Based on the population estimate in Table 1, and taking an indicative range of 40–80% as a guide for the probable proportion of non-breeding birds in Collared Crow populations, the number of mature individuals (20–60% of the population) would be in the range of 400–1,100 birds. This is substantially lower than the estimate of 10,000–19,999 mature individuals provided by BirdLife International (2016).

The exact timing of the decline in Collared Crow numbers in China is difficult to pinpoint. However, it is likely that major changes in agricultural practices in the 1950s have contributed significantly and, whilst current threats are unclear, it is assumed that loss of food supply owing to agricultural intensification and an associated over-use of pesticides remain major problems. The low numbers in Guangdong province relative to the numbers in Hong Kong would indicate that this is an ongoing constraint. Persecution in some areas by humans is a casual factor (BirdLife International 2016, Madge 2016) and it is traded at markets in southern China, although the scale of such trade is unknown (Kadoorie Farm & Botanic Garden 2004). However, some declines are much more recent. For example, at Kinmen Island, Taiwan, up to 176 individuals were recorded in 1989 but it has declined significantly since then (BirdLife International 2016) to a current population of about 18 individuals (Table 2). Based on the findings of this study, this alone accounts for a decline of about 8% in the world population.

Conservation status

As noted above, both the population estimate and number of mature adults given by BirdLife International (2016) are considered to be major over-estimates and a review of the threat status for Collared Crow is required. Applying IUCN Red List criteria, the number of mature individuals is probably best placed in the 2,500–10,000 range. It is difficult to clearly determine subpopulations

Table 2. Summary of coverage and results of surveys conducted in Guangdong province, Macau and Hong Kong 2003–2014.

Prefecture/Administrative Region	No. of 5 km squares surveyed	No. of 5 km squares in which Collared Crows were recorded	Total no. of individuals recorded
Guangzhou	34		
Shenzhen	64	10	15
Qingyuan	4		
Shaoguan	61		
Heyuan	None		
Meizhou	None		
Chaozhou	7		
Zhaoqing	44		
Yunfu	2		
Foshan	10		
Dongguan	10		
Huizhou	33	1	1
Shanwei	19		
Jieyang	None		
Shantou	8		
Zhanjiang	127		
Maoming	32		
Yangjiang	56	1	4
Jiangmen	77		
Zhongshan	None		
Zhuhai	17		
Macau	3		
Hong Kong	106	38	362
Total	714	50	382

and it could be argued that, given the lack of geographical barriers, the species should be treated as one subpopulation linked by dispersal. With less than 10,000 individuals, a continuing decline, and all mature individuals in the same subpopulation, it would therefore qualify as Vulnerable under C2(a)(ii). As such it is proposed that Collared Crow be uplisted from Near Threatened to Vulnerable.

Further research

There are clearly major gaps in our understanding of the ecology of Collared Crow and a more detailed understanding of habitat requirements (beyond a preference for wetlands) and the breeding ecology of the species are required. In particular, studies of the age of first breeding and proportions of non-breeding birds are critical to an adequate assessment of its status. Further surveys in the Dabie Shan to investigate seasonal variation in numbers and habitat utilisation are recommended. Surveys in northern Vietnam looking for additional sites for the species are also recommended. Finally, communal roosts in Hong Kong have been counted on a systematic basis for a number of years and such counts enable long-term population trends to be assessed (Stanton *et al.* 2014); studies of similar roosts elsewhere would be welcome.

ACKNOWLEDGEMENTS

We thank the following: for help with locating books and papers, F. E. Warr and Alison Harding (BMNH), Linda Birch (Edward Grey Institute, Oxford University) and Inter-Library Loan staff (Chinese University of Hong Kong); for help with translation from Chinese, Y.-L. Mo-yung and Grace Yang. Thanks to Katherine Leung for help with obtaining information through ChinaBirdnet, Tommy Hui for help with collation and translating website data, and Jenny Hui and Lag Wan for help with mapping. Jonathan Eames and Pan Chih Yuan provided details of sightings in Vietnam and Taiwan respectively, and Rob Martin provided helpful feedback on a draft manuscript. Finally, this paper would not have been possible without the contributors who have provided records as detailed in Appendix 2.

REFERENCES

- Ascherson, S. R. (1930) A month at Nanking. *Hong Kong Naturalist* 1: 103–111.
- Bartlett, R. (2006) *Birding in Dubai, UAE, Hong Kong, China and Thailand 20 April – 7 May 2006*. Downloaded from <http://www.birdingpal.org/HongKongreport.htm> on 24/08/2014.
- BirdLife International (2016) Species factsheet *Corvus torquatus*. Downloaded from <http://www.birdlife.org> on 30/08/2016.
- Brazil, M. A. (2009) *Birds of East Asia*. London: Christopher Helm.
- Caldwell, H. R. & Caldwell, J. C. (1931) *South China birds*. Shanghai: Hester May Vanderburgh.
- Cao Q. K. (1987) *Birds of Beijing*. Beijing: Beijing Publishing House. (In Chinese.)
- Carey, G. J., Chalmers, M. L., Diskin, D. A., Kennerley, P. R., Leven, M. R., Lewthwaite, R. W., Melville, D. S., Turnbull, M. & Young, L. (2001) *The avifauna of Hong Kong*. Hong Kong: Hong Kong Bird Watching Society.
- Carey, G. J. (2009) Rocky and sandy coasts. Pp.19–24 in L. C. Wong, V. M. Y. Lam & G. W. J. Ades, eds. *Ecology of the birds of Hong Kong*. Hong Kong Special Administrative Region: Kadoorie Farm and Botanic Gardens.
- Chang T. L. (1932) A study of birds in Nanking. *Nanking J.* 2: 469–574.
- Chang H., Liao B., Su J., Zhang G. & Guan W. (2012) Bird community diversity of Nansha mangrove wetland in Guangzhou, China (2005–2010). *Chin. J. Appl. Environ. Biol.* 18: 30–34. (In Chinese.)
- Cheng T. H. (1936a) Summer birds seen on the campus of Fukien Christian University, Foochow. *Fukien Christian Univ. J. (A?)* 4 (1): 10–14. (In Chinese.)
- Cheng T. H. (1936b) Birds recorded in the district topography of Chang-Loh Hsien, Fukien. *Fukien Christian Univ. J. (B?)* 4 (1): 10–14. (In Chinese.)
- Cheng T. H. (1941a) Notes on bird observations during the summer along the Shaowu Stream in North Fukien. *Peking Nat. Hist. Bull.* 15 (3): 235–241. (In Chinese.)
- Cheng T. H. (1941b) A winter census of birds along the Shaowu Stream in North Fukien. *Peking Nat. Hist. Bull.* 16 (1): 85–90. (In Chinese.)
- Cheng T. H. (1960) Birds of Huang Shan mountain in Anhwei Province. *Chinese J. Zool.* 4: 10–14. (In Chinese.)
- Cheng T. H., ed. (1963) *China's economic fauna: birds*. Beijing: Science Publishing Society. (In Chinese.)
- Cheng T. H. (1987) *A synopsis of the avifauna of China*. Beijing: Science Press.
- Cheng T. H. & Tan Y. K. (1973) On the birds of Hainan. II. Passeriformes. *Acta Zool. Sinica* 19: 405–416. (In Chinese.)
- Cheng T. H., Cheng P. L., Cha F. C., Wang S. M., Yin T. Y., Chia H. K. & Chien, Y. W. (1960–1961) A preliminary survey of birds of Hunan province. *Acta Zool. Sinica* 12: 293–319, 13: 97–121. (In Chinese.)
- Cheng T. H., Chien Y. W., Kuan K. T. & Chen F. K. (1962) An avifaunal survey of the Tsingling and Ta-pa-shan region. *Acta Zool. Sinica* 14 (3): 361–380. (In Chinese.)
- Cheng T. H., Tan Y. K., Liang C. Y. & Chang C. F. (1963) Studies on birds of Mount Omei and their vertical distribution. *Acta Zool. Sinica* 15: 317–335. (In Chinese.)
- Cheng T. H., Tan Y. K. & Li Y. H. (1965) On the avifauna of northwestern Szechwan. *Acta Zool. Sinica* 17: 435–450. (In Chinese.)
- China Ornithological Society (2004) *China bird report 2003*. Beijing: China Ornithological Society.
- China Ornithological Society (2005) *China bird report 2004*. Beijing: China Ornithological Society.
- China Ornithological Society (2006) *China bird report 2005*. Beijing: China Ornithological Society.
- China Ornithological Society (2008) *China bird report 2007*. Beijing: China Ornithological Society.
- Chong L. T. (1936) Notes on some birds of Honan and south Anhwei. *Sinensia* 7 (4): 459–470.
- Chong L. T. (1938) Birds of Nanking and its vicinity. Part I. *Cont. Biol. Lab. Science Soc. China*, 12 Zoological series 9: 183–373.
- Collaerts, E. (2006) Collared Crow, China, Sichuan, June 2006. Downloaded from <http://www.surfbirds.com/gallery/search2.php?species=Collared%20Crow> on 24/08/2014.
- David, A. (1871) Catalogue des oiseaux de la Chine observés dans la partie septentrionale de l'Empire (au nord du Fleuve-Bleu) de 1862 a 1870. *Nouv. Arch. Mus.* 7 (1): 3–14.
- David, A. & Oustalet, E. M. (1877) *Les oiseaux de la Chine*. Paris: Libraire de l'Académie de Médecine.
- Dye, J. B. (1969) Bird watching 1916–1949 in Chengtu, Szechwan, West China. *Chung Chi J. (Chung Chi College, Sha Tin, Hong Kong)* 9 (1): 48–65.
- Ericsson, P. (2010) Collared Crow, Yangshou, Guangxi, China. Downloaded from <http://www.pbase.com/image/124436222> on 24/08/2014.
- Fairbank, R. (2010) China May 2010: Fuzhou. Downloaded from <http://birdingneversleeps.blogspot.hk/2011/07/china-25-26-may-2010-fuzhou.html> on 24/08/2014.
- Fellowes, J., ed. (2005) Wildlife whereabouts — some recent records of conservation importance 2004. *Living Forests* 9: 36–41.
- Fiebig, J. (1983) Ornithologische beobachtungen in Peking und Umgebung. *Mitt. Zool. Mus. Berlin* 59. (Ann. Orn. 7): 163–187.
- Fu T. S. (1937) *L'étude des Oiseaux du Ho-nan*. Langres: Imprimerie Moderne.
- Gayot, C. (1922) *Les oiseaux de Chang-hai (observations ornithologiques 1913–1920)*. Shanghai: Zikawei.
- Gressit, J. L. (1940) A winter census of Lingnan birds. *Lingnan Sci. J.* 19: 197–203.
- Guan G. X., Deng J., Wang D., Zhou F., Meng Z.-B. & Lu J.-Q. (1986) On the avifauna of the coast and islets of the estuary of the Pearl River. *Ecological Sciences* 2: 17–30. (In Chinese.)
- Hartert, E. (1910) The birds of Hainan. *Novit. Zool.* 17: 189–254.
- Hartlaub, G. (1892) Ein beitrag zur ornithologie Chinas. *Abhandl. Naturw. Ver. Bremen* 12 (2): 295–335.

- Hemmingsen, A. M. & Guildal, J. A. (1968) Observations on birds in north eastern China, II. *Spolia Zool. Mus. Hauniensis* 28: 1–326.
- Hobcroft, D. (2014) Tour report China: birds and culture April 16–May 1, 2014. Downloaded from http://www.ventbird.com/system/tour_departure_legacy_birdlist/2294/814CZ1.pdf on 24/08/2014.
- Jabouille, P. (1935) Une collection d'oiseaux du territoire de Kouang-tcheou-wan. *L'Oiseau et RFO* 5: 34–69, 235–257.
- Jännes, H. (2009) Northern China 21 May – 5 June 2009 tour report. Downloaded from [http://www.birdquest-tours.com/pdfs/report/CHINA%20\(NORTHERN\)%20REP%2009.pdf](http://www.birdquest-tours.com/pdfs/report/CHINA%20(NORTHERN)%20REP%2009.pdf) on 24/08/2014.
- Kadoorie Farm & Botanic Garden (2004) Wild animal trade monitoring at selected markets in Guangzhou and Shenzhen, South China, 2000–2003. Hong Kong SAR: Kadoorie Farm & Botanic Garden. Technical Report No. 2.
- Jordans, A. & Niethammer, G. (1940) Eine Vogelausbeute aus Fukien. *Verh. Orn. Ges. Bay.* 22 (1): 98–136.
- Kershaw, J. C. (1904) List of the birds of the Quangtung Coast, China. *Ibis* 46 (2): 235–248.
- Kolthoff, K. (1932) Studies on birds in the Chinese provinces of Kiangsu and Anhwei 1921–1922. *Goteborgs Kungl. Vetensk. Vitterh. Samh-Handl.* 5 (B. 3): 1–190.
- Kuroda, N. (1921) On a collection of birds from Hainan. *Dobutsugaku Zasshi* 33: 389–393. (In Japanese.)
- Kuroda, N. (1929) Birds observed and collected on board or on land during the voyage between Kobe, Singapore and Java, 1929. *Tori* 6(28): 48–54.
- La Touche, J. D. D. (1892) On birds collected or observed in the vicinity of Foochow and Swatow in south-east China. *Ibis* (6)4: 400–430, 477–503.
- La Touche, J. D. D. (1906–1907) Field-notes on the birds of Chinkiang, Lower Yangtse Basin. *Ibis* (8)6: 427–450, 617–641, (8)7: 1–30.
- La Touche, J. D. D. (1922) On the birds of the province of Hupeh in central China. *Ibis* (11)4: 445–471.
- La Touche, J. D. & Rickett, C. B. (1905) Further notes on the nesting of birds in the province of Fohkien, S.E. China. *Ibis* (8)5: 25–67.
- Leanranger, P. (2013) Collared Crow, Guilin, November 2012. Downloaded from <https://www.flickr.com/photos/110648625@N05/11784735236/in/photostream/> on 24/08/2014.
- Lee K. S., Lau M. W. N., Fellowes, J. R. & Chan B. P. L. (2006) Forest bird fauna of South China: notes on current distribution and status. *Forktail* 22: 23–38.
- LeFevre, R. H. (1962) The birds of Northern Shantung province, China. Printed privately.
- Lewthwaite, R. W. (1996) Forest birds of southeast China. *Hong Kong Bird Report* 1995: 150–203.
- Li G. Y., Liu L. C., Zhang R. Y. & Zhang Q. M. (1976) On the avifauna of Baoxing, Sichuan. *Acta Zool. Sinica* 22 (1): 101–114. (In Chinese.)
- Li J. H., Tang Z. Y. & Xing J. H. (1959) A survey of the birds in Shanghai. *Acta Zool. Sinica* 11 (3): 390–408. (In Chinese.)
- Li L., He Y.-X., Ding Z.-L., Liao B.-W., Zhang G.-P. & Chang H. (2012) *Urban Environ. & Urban Ecol.* 25(5): 11–15. (In Chinese.)
- Liao W. P. (1982) An investigation on the birds from Ding Hu Shan. Pp. 209–231 in *Tropical and Subtropical Forest Ecosystem*, 1. Guangzhou: Popular Science Press. (In Chinese.)
- Lin S., Ye Y., Li J., Wu G. & Sun F. (2013) Study of bird diversity of Tiegang Reservoir in a highly urbanized area. *Sichuan J. Zool.* 32(2): 297–301. (In Chinese.)
- Liu Y., Zhang Z. W., Li J. Q., Zhang Y., Lu S. & Ruan X. F. (2008) A survey of the birds of the Dabie Shan range, central China. *Forktail* 24: 80–91.
- Liu Z.-B., Huang H.-Q., Zeng X.-R., & Wang Y.-J. (2005) Study of bird resource of Shenzhen Bijiashan Park. *Acta Scientiarum naturalium Universitatis Sunyatseni* 44: 53–60. (In Chinese.)
- Lo C.-F. (2010) Birding trip to Yang county, Shaanxi province. *Hong Kong Birdwatching Society Bull.* 218: 19–20.
- Madge, S. & Burn, H. (1994) *Crows and jays*. London: Christopher Helm.
- Madge, S. (2016) Collared Crow *Corvus pectoralis*. In: J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie & E. de Juana, eds. *Handbook of the birds of the world alive*. Barcelona: Lynx Edicions. (retrieved from <http://www.hbw.com/node/60802> on 30/08/2016).
- Martens, G. P. (1910) Ornithologia Fukiensis. *J. Orn.* 58: 209–275, 421–483.
- McGowan, K. J. (1997) Reproductive and social behavior of two crow species in New York. <http://www.birds.cornell.edu/crows/hatchrep.html>.
- Mell, R. (1922) Beitrage zur Fauna sinica. *Archiv fur Naturgeschichte* 88 (10): 1–100.
- Moffett, L. I. & Gee, N. G. (1913) Checklist of birds of the lower Yangtse valley from Hankow to the sea. *J. Roy. Asiatic Soc. (North China Branch)* 44: 113–143.
- Morrison, A. (1948) A winter collection from central Szechuan, China. *Ibis* 90: 381–387.
- Ogilvie-Grant, W. R. (1900) On the birds of Hainan. *Proc. Zool. Soc.* 1900: 457–504.
- Piechocki, R. (1958) Beitrage zur Peking Nord-und Nordost-Chinas (Mandschurei). *Abh. Mus. Tierk. Dresden* 24: 105–203.
- Qiu C.-R., Zhuang P.-D. & Chang H. (2007) Avifauna and bird resources in Mount Yangtai Forest Park of Shenzhen City. *Ecologic Science* 26(2): 146–150. (In Chinese.)
- Roselaar, C. S. (1994) Corvidae (crows and allies). In S. Cramp & C. M. Perrins, eds. *The birds of the Western Palearctic*, 8. Oxford: Oxford University Press.
- Schäfer, E. & Meyer de Schauensee, R. (1938) Zoological results of the second Dolan expedition to western China and eastern Tibet, 1934–1936. Part II, Birds. *Proc. Acad. Nat. Sci. Philadelphia* 90: 185–260.
- SCIEA (South China Institute of Endangered Animals) (1991) *A pictorial guide to the birds of Guangdong*. Guangzhou: Guangdong Science and Technology Press. (In Chinese.)
- Severinghaus, L. L., Ding T. S., Fang W. S., Lin, W. H., Tsai M. C. & Yen C. W. (2012) *The avifauna of Taiwan*. Second edition. Taipei: Forestry Bureau, Council of Agriculture. (In Chinese.)
- Shaw, T. H. (1932) Notes on some passerine birds from Szechwan. *Bull. Fan Memorial Inst. Biol.* 3: 217–235.
- Shaw, T. H. (1934) Notes on the birds of Chekiang. *Bull. Fan Memorial Inst. Biol.* 5: 285–338.
- Slater, H. H. (1882) Notes on a collection of birds on the River Yang-tse-kiang. *Ibis* 24(3): 431–436.
- Sowerby, A. de C. (1943) Birds recorded from or known to occur in the Shanghai area. *Notes d'Orithologie Musee Heude*. 1: 1–212.
- Stanton, D. J., Smith, B. R. & Leung K. K. S. (2014) Status and roosting characteristics of Collared Crow *Corvus torquatus* at the Mai Po Nature Reserve, Hong Kong. *Forktail* 30: 79–83.
- Streich, J. (1903) Die Avifauna eines Gartens in Swatau, Sud-China. *J. Orn.* 51: 515–527.
- Styan, F. W. (1891) On the birds of the Lower Yangtse Basin. *Ibis* 6(3): 316–359, 481–510.
- Sun Z. W., Lu W. H., Lewthwaite, R. W., Li G. C., Yu R. D., Leven, M. R., Williams, M. D. & Sherred, K. (2003) Summer birds investigation in Nan Ao and its nearby islands of Guangdong province. *J. Shantou Univ.* 18 (3): 1–6. (In Chinese.)
- Swinhoe, R. (1860) The ornithology of Amoy (China). *Ibis* 2: 45–68.
- Swinhoe, R. (1861a) Notes on the ornithology of Hong Kong, Macao and Canton, made during the latter end of February, March, April, and the beginning of May, 1860. *Ibis* 3: 23–57.
- Swinhoe, R. (1861b) Notes on ornithology taken between Takoo and Peking, in the neighbourhood of the Peiho River, Province of Chelee, North China, from August to December, 1860. *Ibis* 3: 323–345.
- Swinhoe, R. (1863) Catalogue of the birds of China, with remarks principally on their geographical distribution. *Proc. Zool. Soc. London* 1863: 259–339.
- Swinhoe, R. (1870) On the ornithology of Hainan. *Ibis* (2)6: 77–97, 230–256, 342–367.
- Traylor, M. A. (1967) A collection of birds from Szechwan. *Fieldiana Zool.* 53 (1): 3–67.

- Vaughan, R. E. & Jones, K. H. (1913) The birds of Hong Kong, Macao, and the West River or Si Kiang in south-east China, with special reference to their nidification and seasonal movements. *Ibis* 55: 17–76, 163–201, 351–384.
- Verica, J. (2010) China Trip Report – summer 2010. Downloaded from <http://birdingnerd.blogspot.hk/2010/08/china-trip-report-summer-2010.html> on 24/08/2014.
- Walton, H. A. (1903) Notes on the birds of Peking. *Ibis* 45: 19–35.
- Wang J. X., Wu S. X., Huang G. Y., Yang W. Y., Cai Z. Y., Cai S. Q. & Xiao Q. I. (1991) *A pictorial guide to the birds of Taiwan*. Taipei: Wild Bird Society Press of Taiwan and Japan. (In Chinese.)
- Wilder, G. D. & Hubbard, H. W. (1924) List of birds of Chihli province. *J. North China Branch of the Royal Asiatic Soc.* 55: 156–239.
- Wu Z. K., Lin Q. W., Yang J. L., Liu J. C. & Wu L. (1986) *The avifauna of Guizhou*. Guizhou: People's Publishing House. (In Chinese.)
- Yang L. & Yang X. J., eds. (2004) *The avifauna of Yunnan, China*, 2. Kunming: Yunnan Science and Technology Press.
- Yen K. Y. (1930) Birds from Yaoshan, Kwangsi. *Bull. Dept. Biology, Sun Yatsen University* 5: 1–32.
- Yen K. Y. (1932) Etude d'une collection d'oiseaux du nord du Kwangtung. *Bull. Mus. d'Histoire Naturelle* 4: 243–261.
- Yen K. Y. (1933–1934) Les oiseaux du Kwangsi. *L'oiseau et la revue française d'ornithologie* 3: 204–243, 615–638, 755–788; 4: 24–51, 297–317, 489–507.
- Zou F.-S. & Ye G.-F., eds. (2016) *Distribution list of Guangdong terrestrial vertebrates*. Guangzhou: Guangdong Science and Technology Press (In Chinese and English).
- Zheng Z.-W., Zhang C.-L. & Hu H.-J. (2008) Baseline survey and holistic characters of bird in Guangzhou, China. *Chinese J. Zool* 43(1): 122–133. (In Chinese.)
- Zhong F., Dong W., Li W. & Huang X. (2012) Community structure and diversity of birds in Meijiang River valley. *Ecol. & Environ. Science* 21(5): 825–833. (In Chinese.)
- Zhou Y. Y., Qin Y. L., Wang Y. P. & Yu S. J. (1981) On the terrestrial vertebrates of the Dinghu Shan area. *Guangdong Zool. Soc. Coll. Theses* 2: 48–60. (In Chinese.)
- Zhuang X., Cao S. & Hu G. (2013) Survey of vertebrate resources at Dapeng Peninsula National Geological Park, Shenzhen. *Tropical Geography* 33(5): 584–587. (In Chinese.)

PAUL J. LEADER & DAVID J. STANTON, AEC Ltd, 127 Commercial Centre, Palm Springs, New Territories, Hong Kong. Email: pjl@aechk.hk (corresponding author), djs@aechk.hk

JONATHAN MARTINEZ, 14 bis, Rue des Temples, 45240 La Ferté-Saint-Aubin, France. Email: jonathmartinez@gmail.com

RICHARD W. LEWTHWAITE, 2 Villa Paloma, Shuen Wan, Tai Po, Hong Kong. Email: myrlvp@gmail.com

Appendix 1.

Historical distribution of Collared Crow in China and Taiwan 1855–1980.

Overview

David & Oustalet (1877) noted 'This crow is one of the most characteristic birds of the Chinese avifauna. It is found in all parts of the Chinese Empire outside the mountainous zone, but it is particularly widespread in southern provinces. It lives in pairs in paddyfields and in the vicinity of watercourses, and hardly ever ventures into the interior of villages like its congeners. It is a sedentary species.'

Styan (1891) commented 'A very common resident [in the Lower Yangtze Basin in the 1880s]... Generally seen singly or in pairs, but in winter a number will sometimes congregate together. When out shooting I have been followed for a long distance by at least thirty of them hovering close overhead, attracted by my dog. They will sometimes follow one thus for a mile.'

Note: Styan's recording area 'the Lower Yangtze Basin' extended over the final 1,000 km of the Yangtze River's course between Wuhan and the Delta, including parts of southern Hubei, northern Jiangxi, southern Anhui, southern Jiangsu, northern Zhejiang and Shanghai.

Ascherson (1930) commented that 'All the way up the Yangtze and in the country around Nanking [Nanjing], one is amazed at the numbers and conspicuousness of the nests of the Magpies, Collared Crows and Black-eared Kites.'

Distribution by province

Localities and dates of *Specimens* listed in this section are as enumerated in the literature and/or listed in museum collections. Acronyms for museums are as follows:

NHMUK – Natural History Museum, Tring, UK
 MCZ – Museum of Comparative Zoology, Massachusetts, USA
 ZMB – Universität Humboldt, Museum für Naturkunde, Berlin, Germany
 RMNH – Naturalis Biodiversity Center, Leiden, Netherlands

Anhui

Abundance/distribution:

Koltoff (1932): 'Common [in eastern Anhui in 1922]. Two pairs bred near Chuchow [Chuzhou].'

Chong (1936): 'The Collared Crow is commonly resided on the plain or low-hills [in southern Anhui in the 1930s].'

Specimens:

Huang Shan, September 1933 (Chong 1936); Jinhushan, 25 October 1948 (Cheng 1960).

Beijing

Abundance/distribution:

Swinhoe (1861b): 'I occasionally saw this species [between Tianjin and Beijing in 1860].'

Walton (1903): 'In the middle of August [1900], when I reached Peking, there were very few of these handsome crows; from October onwards they arrived in large numbers, and were quite common during the winter.' Hemmingsen & Guildal (1968): 'Both in winter and summer [in the 1940s] adults and young are met with in small numbers near water.'

Piechocki (1958): 'I saw them in the rice fields at the beginning of May [1956].'

Fiebig (1983): Three active nests found in the Summer Palace grounds, 14 April 1977.

Specimens:

14 January 1898 (MCZ); 3 January 1957, 12 and 25 November 1958, 10 September 1961 (Cao 1987).

Chongqing

Abundance/distribution:

Morrison (1948): 'A common bird everywhere [the city of Chongqing and hills 50 km to its north in the years 1943–1945], but generally seen in the hills in pairs.'

Specimens:

Changshou, 4 April 1908 (MCZ); Chongqing, May 1930 (Shaw 1932).

Fujian

Abundance/distribution:

Swinhoe (1860): 'The common crow [at Xiamen in 1855–1859] ... a permanent resident.'

La Touche (1892): 'Common and resident [at Fuzhou in the late 1880s]. La Touche & Rickett (1905): 'The common crow [at Fuzhou in the late 1890s] ... an early breeder.'

Caldwell & Caldwell (1931): 'This is the well known Parson Crow of the plains. It may be seen singly or in colonies practically everywhere [in southern Fujian in the 1920s]. It abounds in newly ploughed fields and partly flooded regions ... It is a common scavenger along rivers. At all times the crows are sociable, but in winter doubly so, assembling by the hundreds at some common roosting place.'

Cheng (1936a, b): Up to seven individuals recorded on the campus of Fukien Christian University, Fuzhou in a summer bird survey, June–August 1936 and at Changle around the same time.

Cheng (1941a, b): Recorded in summer and winter on the river south of Shaowu including a total of 24 individuals counted, 26–28 August 1940.

Specimens:

Xiamen (two), April 1860 (RMNH); Xiamen, April 1861 (BMNH); Fuzhou, 15 December 1895, February 1896, December 1896, 20 January 1913, December 1913 (three) (MCZ); unknown locality (two), 1903–1909 (Martens 1910); Fuzhou, December 1928 (Kuroda 1929); Shaowu, 24 June 1937 (Jordans & Niethammer 1940).

Gansu**Abundance/distribution:**

Cheng (1987): Recorded in the southern part of the province.

Guangdong, Hong Kong and Macau**Abundance/distribution:**

Swinhoe (1861a): 'Common [in Guangzhou, Hong Kong and Macau in February–May 1860]'.
La Touche (1892): 'Common and resident [at Shantou in the late 1880s]'.
Streich (1903): A common resident at Shantou in the period 1889–1902.
Kershaw (1904): 'Very common and resident [in the Hong Kong-Macao area in the early 1900s]'.
Vaughan & Jones (1913): 'A common bird throughout the districts treated in this article [Hong Kong, Macau, the Pearl River Delta, the North River north to Shaoguan and the West River from the Pearl River Delta through western Guangdong to Guixian in central Guangxi in 1900–1908] ... never found far away from water, either salt or fresh ... during the winter months selects certain favoured roosting-places ... and to these, at the close of day, large numbers may be seen winging their way from the feeding-grounds'.
Mell (1922): 'Resident, probably common throughout the province'.
Yen (1930): 'Much more common [in northern Guangdong in 1930–1931] than the preceding species [*C. macrorhynchus*]'.
Jabouille (1935): 'Much more common [in Zhanjiang in 1932–1933] than the preceding species [*C. macrorhynchus*]'.
Gressit (1940): One on the Lingnan College campus [now Sun Yat-sen University], Guangzhou in winter 1939/1940.
Zhou *et al.* (1981): In the Dinghu Shan area, Zhaoqing 1959–1966.
Liao (1982): In the Dinghu Shan area in 1979–1980 in similar numbers to previous years.
Guan *et al.* (1986): Breeding on Sanzao Island in the Pearl River Delta in 1980–1981.
Sun *et al.* (2003): Recorded from Nan'ao Island with counts of up to 3 between 14–17 June 2001.
Zou & Ye (2016): Listed from the prefectures/cities of Guangzhou, Shaoguan, Shenzhen, Zhuhai, Shantou, Zhaoqing, Huizhou, Meijiang River, Heyuan, Yangjiang, Qingyuan and Yunfu.

Specimens:

Naozhou Island, 2 February 1868 (Swinhoe 1870); Macau, 14 March 1902 (NHMUK); 'Nam Long' [untraced locality on North River], 22 March 1905 (NHMUK); Fengwan, 3 April 1916, Xiaokeng, 5 February 1917 (ZMB); northern Guangdong (three), 19 March 1930, 8 January 1931 (Yen 1930); Zhanjiang (three), 1 and 12 May 1932 (Jabouille 1935); Lianshan, Yangshan, Lianping, Qieyang, Lufeng, Chao'an, Chenghai and Guangzhou, late 1950s–early 1960s (SCIEA 1991).

Guangxi**Abundance/distribution:**

Vaughan & Jones (1913): 'A common bird [along the West River from Wuzhou to Guixian in the early 1900s]'.
Yen (1930): 'A common resident up to 250m [at Yao Shan]'.
Yen (1933–1934): 'Sedentary [in central and eastern Guangxi] and even more common than the preceding species [*C. macrorhynchus*]'.
Specimens:
Pingnan, 20 April 1931 (Yen 1933–1934).

Specimens:**Guizhou****Abundance/distribution:**

Wu *et al.* (1986): Flocks of several tens encountered in the vicinity of villages and farmland (300–2,400 m) in winter and spring in 1963–1982, and a nest containing two young birds found at Longlixian on 28 April 1981.
Specimens:
Yinjiang, 25 April 1964, Xingyi, 23 October 1974, Chishui, 24 April 1975, Zunyi, 20 May 1975, Suiyang, 8 and 13 December 1976, Guiding, 18 November 1977, Jiangkou, 15 March 1978, Xifeng, 7 December 1978 (Wu *et al.* 1986).

Hainan

Last recorded 1963.

Abundance/distribution:

Swinhoe (1870): 'In the plains of the north and north-west of Hainan this bird frequently occurs ... it is evident that they are early breeders in Hainan as in South China'.

Ogilvie-Grant (1900): Seen at Haikou, 5–9 March 1899 per John Whitehead's diary.

Specimens:

Haikou (three), February/March 1868 (Swinhoe 1870); Haikou, 1890 or 1891 (Hartlaub 1892); Haikou (10), February–April, November–December 1902, Ledong, 11 March 1903, Utoshi, 21 March 1903 (Hartert 1910); Haikou, 20 January 1920 (Kuroda 1921); Wenchang, January, February and June in the late 1950s or early 1960s (Cheng & Tan 1973); Wanning, 31 May 1960, Lingshui, 7 and 13 February 1963 (South China Institute of Endangered Animals collection, Guangzhou, China).

Hebei**Abundance/distribution:**

Wilder & Hubbard (1924): 'Fairly common resident throughout the province, but less common at the seashore and in the mountains. It also seems less common in summer than at other seasons. Lays in April and May'.
Specimens:
Xian and Hejian in the 1920s or 1930s (Seys & Licent 1933–1934 in Hemmingsen & Guildal 1968).

Henan**Abundance/distribution:**

Fu (1937): 'Sedentary and common on the plain [in the years 1931–1934]'.
Hubei
Abundance/distribution:
La Touche (1922): 'A common resident [at Shashi in the years 1917–1919]'.
Specimens:
Yichang, October or November 1880 (Slater 1882); Yichang 10 October (three) and 31 October 1907, 'Chang Koo Hsien' [untraced locality in western Hubei], 3 February 1908 (MCZ).

Hubei**Abundance/distribution:****Hunan****Specimens:**

Dongting Lake, 21 November 1898 (Ogilvie-Grant 1900); Changde, 24 and 26 October, Hengshan, 4 April, Liling, 9 June, Leiyang, 27 November, Zixing, 13 November, Yizhang, 9 November in 1955 and 1957 (Cheng *et al.* 1960–1961).

Jiangxi**Abundance/distribution:**

Presumably recorded in the north of the province by Styan (1891).
Jiangsu
Abundance/distribution:
La Touche (1906–1907): 'A very common resident [at Zhenjiang in the early 1900s]'.
Koltoff (1932): 'Common [in Jiangsu south of the Yangtse River in 1921–1922]; not so common north of the river'. The author also reported the progress of 31 pairs nesting in the plains and hills near Zhenjiang and mentioned another pair at Suzhou.
Ascherson (1930): 'Very common [at Nanjing in April–May 1930]'.
Chang (1932): 'One of the common crows [in the vicinity of Nanjing, 1931–1932]'.
Chong (1938): 'One of the common residents [in Nanjing, 1925–1936]'.
Specimens:
Nanjing, 25 October 1923 (MCZ), Nanjing (ten), unknown dates 1925–1936 (Chong 1938).

Jiangsu**Abundance/distribution:****Shaanxi****Abundance/distribution:**

Cheng *et al.* (1962): Up to 12 birds encountered in a single day in the Qinling mountains in April–July, 1957–1958.
Specimens:
Yang Xian, Zhanba, unknown dates in 1957–1958 (Cheng *et al.* 1962).

Shandong**Abundance/distribution:**

LeFevre (1962): 'Most numerous in western Shantung [1923–1927]. They decrease in numbers as one goes from Tsinan [Qinan] towards Tsingtao [Qingdao], so that as one reaches the central part of the province, one rarely sees them ... during the winter they can be seen in numbers at Tsinan ... a bird of the plain'. The author also reported a pair seen at Weishan on 16–17 and 26 January 1925, seven seen by George Wilder at Dexian on 14 April 1935 and two at Ling Xian on 26 April 1936.
Specimens:
Laiyang, 5 May 1909, Qinan, 30 June 1911, Jimo, 11 October 1912, 'Hsingtsunчай' (untraced locality in eastern Shandong), 27 June 1937 (LeFevre 1962).

Shanghai*Abundance/distribution:*

Sowerby (1943): 'A permanent resident ... may occasionally be seen passing over city and suburban districts of Shanghai [between the 1920s and early 1940s], but is not very plentiful ... Two were seen by me in the Western District this spring (1943), being joined later in the summer by four young ones.'

Li *et al.* (1959): Recorded in all months during surveys, 1951–1959.

Specimens:

28 January 1884 (NHMUK); unknown dates prior to 1943 (Sowerby 1943).

Shanxi*Abundance/distribution:*

Cheng (1987): Recorded in the southern part of the province.

Sichuan*Abundance/distribution:*

David (1871): Occurs in Sichuan.

Dye (1969): Sightings of 20–30 individuals near the West China Union University campus, Chengdu in the 1920s and 1930s, but numbers down in the 1940s likely as a result of engineering works on the river.

Cheng (1987): Recorded at Kangding.

Specimens:

Washan, 6 November 1908 (MCZ); Mingshan, 7 May 1931, near Emei Shan, 23 November 1931 (Traylor 1967); Yaan (five) and Chengdu, July–August 1934 (Schäfer & de Schauensee 1938); Emei Shan (four) March–June in 1957–1960 (Cheng *et al.* 1963); Maowen, May 1961 (Cheng *et al.* 1965); Baoxing (850–2,300 m), March–May, September, December 1962–1965 (Li *et al.* 1976).

Tianjin*Specimens:*

Tianjin, 1920s or 1930s (Seys & Licent 1933–1934 in Hemmingsen & Guildal 1968).

Yunnan*Abundance/distribution:*

Yang & Yang (2004): Recorded at Kunming and Yongshan (760–2,100 m).

Zhejiang

Moffett & Gee (1913): At Jiangyin, Hangzhou and Mogan Shan on unknown dates prior to 1913.

Gayot (1922): Recorded on six visits to the Haining area in December, February and March, 1917–1920.

Shaw (1934): 'A permanent resident of the plain and foothills [in the early 1930s] ... single birds or small flocks often met with.'

Specimens:

Hangzhou, 16 October 1931, Wenzhou, 24 July 1932 (Shaw 1934).

Distribution in Taiwan*Abundance/distribution:*

There are only three records from mainland Taiwan, all in the period 1979–1987: at Taichung on 10 October 1979 and 7 August 1981 and at Nantou on 8 August 1987 (Wang *et al.* 1991, Severinghaus *et al.* 2012). It is/was essentially restricted to Kinmen Island, where up to 176 individuals were recorded in 1989, but it has declined significantly since then (BirdLife International 2016).

Appendix 2.

Collared Crow records in China, Taiwan and Vietnam, 2003–2014.

Location	Peak count	Month	Year	Source
Anhui				
Yaoluoping*	?	?	2005	Liu <i>et al.</i> (2008)
Jinzhai*	6	May	2013	http://birdtalker.net/report/userinfo.asp?id=6634
Jixi*	1	May	2013	http://birdtalker.net/report/userinfo.asp?id=5569
Liuan	4	April	2012	'1.732' <i>in litt.</i> 17 November 2014
Shengjin Hu	?	November	2005	China Ornithological Society (2006)
Suzhou	20	January	2011	http://birdtalker.net/report/userinfo.asp?id=4423
Wangjiang	3	March	2013	http://birdtalker.net/report/userinfo.asp?id=5650
Yuexi*	30	October	2012	http://birdtalker.net/report/userinfo.asp?id=5650
Beijing				
Forbidden City	1	October	2011	www.ebird.org
Shisanling Reservoir	1	April	2012	T. Townsend <i>in litt.</i> 3 September 2014
Beijing	1	April	2012	T. Townsend <i>in litt.</i> 3 September 2014
Chongqing				
Chongqing	15	June	2013	http://birdtalker.net/report/userinfo.asp?id=5605
Fujian				
Dahu	12	December	2007	China Ornithological Society (2008)
Dahu	5	May	2010	Fairbank (2010)
Dahu	2	?	2012	Menxiu Tong <i>in litt.</i> 19 September 2014
Dayang, Putian	1	February	2007	China Ornithological Society (2008)
Fuding	1	April	2006	http://birdtalker.net/report/userinfo.asp?id=463
Fuding	20	?	2012	Menxiu Tong <i>in litt.</i> 19 September 2014
Longhai	3	March	2012	http://birdtalker.net/report/userinfo.asp?id=5470
Minhou	12	December	2007	Gao Chuan <i>in litt.</i> 23 November 2014
Ningde	3	January	2008	http://birdtalker.net/report/userinfo.asp?id=463
Putian	1	July	2007	Xiamen Bird Watching Society <i>in litt.</i> 17 November 2014
Putian	?	?	2012	Menxiu Tong <i>in litt.</i> 19 September 2014
Xiamen	5	September	2009	Meng Xianwei <i>in litt.</i> 8 December 2014
Zhangzhou	5	December	2011	http://birdtalker.net/report/userinfo.asp?id=4626
Gansu				
Luqu	20	May	2009	Lei Ming <i>in litt.</i> 8 December 2014

Location	Peak count	Month	Year	Source
Guangdong				
Futian	2	March	2004	China Ornithological Society (2005)
Futian	2	October	2004	China Ornithological Society (2005)
Futian	5	January	2007	China Ornithological Society (2008)
Futian	4	April	2007	China Ornithological Society (2008)
Huizhou	1	Apr	2013	Authors pers. obs.
Guangzhou	?	?	2005–2006	Zheng <i>et al.</i> (2008)
Nansha mangrove wetland, Guangzhou	?	?	2005–2010	Chang <i>et al.</i> (2012)
Meijiang river valley	8	?	2010–2011	Zhong <i>et al.</i> (2012)
Bijiashan Park, Shenzhen	'rare'	?	2004	Liu <i>et al.</i> (2005)
Dapeng, Shenzhen	?	?	2012–2013	Zhuang <i>et al.</i> (2013)
Mount Yangtai, Shenzhen	?	?	2006	Qiu <i>et al.</i> (2007)
Tiegang Reservoir, Shenzhen	'dominant'	?		Lin <i>et al.</i> (2013)
Shenzhen	Up to 2	?	2004–2014	G. Yang pers. com.
Yangjiang	4	October	2014	Authors pers. obs.
Zhuhai (Hezhou wetland)	6	March	2011	Li <i>et al.</i> (2012)
Guangxi				
River Li, Guilin & Yangshao	7	?	2004–2014	Twelve records of one to seven birds are listed on www.ebird.org
Guilin	?	?	2006	Bartlett (2006)
Guilin	46	August	2007	China Ornithological Society (2008) http://birdtalker.net/report/userinfo.asp?id=1301
Guilin	'small roost'	Summer	2010	Verica (2010)
Guilin	2	November	2012	Leanranger (2013)
Lipu	2	January	2014	Mo Xunqiang <i>in litt.</i> 17 November 2014
Sanjiang	1	January	2013	Sun Jiajie <i>in litt.</i> 5 December 2014
Yangshuo	'many'	April	2010	Ericsson (2010)
Yangshuo	3	August	2014	mzwebby via Birdforum
Yangshuo	36	October	2014	http://birdtalker.net/report/userinfo.asp?id=6568
Zhongfeng	1	September	2004	Fellowes (2005)
Guizhou				
Guiyang	1	March	2006	Meng Xianwei <i>in litt.</i> 8 December 2014
Jiangkou	3	December	2012	Chongqing Feimao <i>in litt.</i> 7 November 2014
Kaiyang	2	February	2009	http://birdtalker.net/report/userinfo.asp?id=3269
Leishan	3	November	2007	http://birdtalker.net/report/userinfo.asp?id=1893
Suiyang	5	May	2008	Cheshi <i>in litt.</i> 4 December 2014
Wenggan	1	March	2006	http://birdtalker.net/report/userinfo.asp?id=408
Weining	1	February	2008	Meng Xianwei <i>in litt.</i> 8 December 2014
Xishui	2	May	2011	Meng Xianwei <i>in litt.</i> 8 December 2014
Yanhe	4	December	2013	http://birdtalker.net/report/userinfo.asp?id=5005
Hebei				
Beidaihe	1	May	2012	M. Andrews <i>in litt.</i> 1 December 2014
Henan				
Dongzhai NNR*	3	November	2003	China Ornithological Society (2004)
Dongzhai NNR*	?	?	2004–2006	Liu <i>et al.</i> (2008)
Dongzhai NNR*	1	?	2010	C. Breisford <i>in litt.</i> 2 September 2014
Dongzhai NNR*	?	March	2012	www.ebird.org
Dongzhai*	?	July	2012	M. Maddock <i>in litt.</i> 2 December 2014
Dongzhai NNR (Baiyun)*	2	March	2013	Authors pers. obs.
Dongzhai NNR (Segang)*	2	March	2013	Authors pers. obs.
Dongzhai NNR*	5	?	2014	www.ebird.org
Dongzhai NNR*	10	?	2014	www.ebird.org
Fangpao*	2	June	2014	www.ebird.org
Lingshan*	10	May	2012	H. Buck <i>in litt.</i> 12 September 2014
Luoshan*	20	June	2013	Zhong Yuetao <i>in litt.</i> 10 December 2014
Shangcheng*	13	October	2007	China Ornithological Society (2008)

Location	Peak count	Month	Year	Source
Shangcheng*	10	March	2012	Zhong Jia <i>in litt.</i> 17 November 2014
Shangcheng County, Gushi County and Huaibin County*	400–500	December	2014	Henan Bird Watching Society <i>in litt.</i> 30 January 2015
Shishankou Reservoir*	?	?	2004–2005	Liu <i>et al.</i> (2008)
Xinyangxian*	1	July	2004	Liao Xiaodong <i>in litt.</i> 21 January 2015
Hong Kong				Taken from Hong Kong Birdwatching Society (HKBWS) records collated between 2003 and 2014 unless otherwise stated. Maximum count taken from each site. Dates and years not included due to multiple records from some sites.
Deep Bay Area (33 localities including Mai Po NR)**	173			K. Leung pers. comm.
Green Island	1			HKBWS
Mount Davis	2			HKBWS
Braemar Hill	2			HKBWS
North Point	2			HKBWS
Aberdeen	2			HKBWS
Stanley	1			HKBWS
Po Toi	1			HKBWS
Sok Kwu Wan	1			HKBWS
South Lamma	1			HKBWS
Lamma	6			HKBWS
Cheung Chau	1			HKBWS
Discovery Bay	2			HKBWS
Pui O	1			HKBWS
Sha Chau	5			HKBWS
Dong Ping Chau	2			HKBWS
Tap Mun	2			HKBWS
Tai O	1			A. S. Moore via Birdforum
Tolo Harbour population (25 localities)**	117			HKBWS
Pak Tam	3			HKBWS
Pak Sha O	2			HKBWS
Sai Kung	8			HKBWS
Inner Port Shelter	1			HKBWS
Pik Sha Road, Clearwater Bay	6			HKBWS
Po Toi O	1			HKBWS
Tsueng Kwan O	2			HKBWS
Kai Tak	1			HKBWS
Kwun Tong	2			HKBWS
Stonecutter's Island	2			HKBWS
Shing Mun	4			HKBWS
Tuen Mun	1			HKBWS
Siu Lam	2			HKBWS
Tai Lam Chung	2			HKBWS
Tsing Yi	2			HKBWS
Hubei				
Anlu*	20	July	2013	Chen Hai <i>in litt.</i> 19 November 2014
Baokang	7	December	2010	Zhang Shuyong <i>in litt.</i> 17 November 2014
Changyang	8	February	2010	http://birdtalker.net/report/userinfo.asp?id=2604
Dawu	28	May	2007	China Ornithological Society (2008)
Dawu	30	September	2008	http://birdtalker.net/report/userinfo.asp?id=1448
Enshi	4	April	2011	Mu Senlin <i>in litt.</i> 13 November 2014
Guangshui	10	August	2007	China Ornithological Society (2008)
Guangshui*	12	July	2010	Li Yi <i>in litt.</i> 17 November 2014
Hongan*	10	June	2010	http://birdtalker.net/report/userinfo.asp?id=3568
Huang	1	?	2010	http://birdtalker.net/report/userinfo.asp?id=3486
Jingmen	6	January	2011	http://birdtalker.net/report/userinfo.asp?id=3144
Jingshan*	5	October	2003	China Ornithological Society (2004)
Jianshan	30	June	2007	China Ornithological Society (2008)

Location	Peak count	Month	Year	Source
Jingshan*	48	June	2009	Yang Jianhuan/Jian-Huan YANG <i>in litt.</i> 11 December 2014
Jiangshi	5	December	2010	http://birdtalker.net/report/userinfo.asp?id=1399
Lichuan	2	August	2014	Zhang Shuyong <i>in litt.</i> 17 November 2014
Luotian	4	October	2008	http://birdtalker.net/report/userinfo.asp?id=2252
Macheng*	1	April	2006	Zhang Yaoqi <i>in litt.</i> 24 December 2014
North Hubei nr Dongzhai*	3	?	2011	C. Brelford <i>in litt.</i> 2 September 2014
Shennonjia	1	April	2007	China Ornithological Society (2008)
Shishou	1	October	2014	Yang Tao <i>in litt.</i> 10 March 2015
Shiyan	4	October	2009	http://birdtalker.net/report/userinfo.asp?id=2252
Songzi	3	January	2013	Zhao Min /Zhao Min <i>in litt.</i> 17 November 2014
Suizhou*	28	September	2009	http://birdtalker.net/report/userinfo.asp?id=2604
Wuchang	2	April	2010	Zhang Yaoqi <i>in litt.</i> 24 December 2014
Wuhan	5	October	2009	Zhang Shuyong <i>in litt.</i> 17 November 2014
Wuhan	4	December	2008	J. Eaton <i>in litt.</i> 3 December 2014
Yichang	6	July	2012	Lei Ming <i>in litt.</i> 8 December 2014
Yingshan*	1	December	2010	http://birdtalker.net/report/userinfo.asp?id=2604
Zhonghua*	?	April	2005	Liu <i>et al.</i> (2008)
Zhongxiang	5	April	2009	http://birdtalker.net/report/userinfo.asp?id=1399
Hunan				
Badagongshan	2	June	2010	Authors pers. obs.
Changsha	1	December	2013	Chen Xuejun <i>in litt.</i> 8 December 2014
Shimen	1	April	2013	http://birdtalker.net/report/userinfo.asp?id=4934
Yueyang	5 (?)	December	2005 (?)	H. F. Cheung via Chinabird.net
Jiangsu				
Liuhe	3	April	2005	http://birdtalker.net/report/userinfo.asp?id=819
Nanjing	1	October	2004	China Ornithological Society (2005)
Yu Shrike Zhang <i>in litt.</i> 7 Nov 2014				
Yixang	4	February	2009	http://birdtalker.net/report/userinfo.asp?id=2522
Jiangxi				
Jianggangshan	2	October	2010	Er Wu Zai <i>in litt.</i> 23 November 2014
Wuyuan	4	May	2008	J. Eaton <i>in litt.</i> 3 December 2014
Xiushiu	6	February	2012	Zhang Lin <i>in litt.</i> 17 November 2014
Macau				
Taipa	1	January	2003	China Ornithological Society (2004)
Taipa	2	October	2004	China Ornithological Society (2005)
?	3	?	2010	www.ebird.org
Shaanxi				
Changqing	2	?	2013	www.ebird.org
Foping	4	April	2004	China Ornithological Society (2005)
Foping	2	November	2010	www.ebird.org
Foping	2	April	2011	J. Dyczkowski <i>in litt.</i> 12 September 2014
Foping	10	April	2012	http://birdtalker.net/report/userinfo.asp?id=3480
Foping	1	?	2014	www.ebird.org
Huxian	9	February	2011	http://birdtalker.net/report/userinfo.asp?id=869
Ningshan	5	January	2009	http://birdtalker.net/report/userinfo.asp?id=1352
Qinling	1-5	June	2008	P. Holt <i>in litt.</i> 16 September 2014
Qinling	4	June	2009	P. Holt <i>in litt.</i> 16 September 2014
Qinling	?	August	2010	Lo (2010)
Qinling	?	April	2014	Hobcroft (2014)
Xian	2	May	2009	J. Eaton <i>in litt.</i> 3 December 2014
Xixiang	1	July	2006	Li Jianqiang <i>in litt.</i> 26 November 2014
Yangxian	2	May	2009	Jännes (2009)
Yangxian	?	April	2011	J. Dyczkowski <i>in litt.</i> 12 September 2014
Yangxian	9	March	2012	http://birdtalker.net/report/userinfo.asp?id=3450
Zhenan	3	February	2013	http://birdtalker.net/report/userinfo.asp?id=5344

Location	Peak count	Month	Year	Source
Zhouzhi	2	June	2012	http://birdtalker.net/report/userinfo.asp?id=869
Sichuan				
?	1	?	2006	Collaerts (2006)
Jiuzhaigou NP	?	May	2007	www.ebird.org
Maerkang	1	June	2008	P.Holt <i>in litt.</i> 16 September 2014
Pingwu	2	May	2009	J. Eaton <i>in litt.</i> 3 December 2014
Pingwu	1	?	2012	http://birdtalker.net/report/userinfo.asp?id=386
Pingwu	1	October	2013	I.Didham <i>in litt.</i> 3 December 2014
Pingwu	2	June	2013	J. Eaton <i>in litt.</i> 3 December 2014
Pingwu	6	May	2014	S. Francis <i>in litt.</i> 4 December 2014
Pingwu	6	June	2014	S. Francis <i>in litt.</i> 4 December 2014
Qingchuan	1	March	2009	http://birdtalker.net/report/userinfo.asp?id=879
Qingxi	15	December	2010	S. Francis <i>in litt.</i> 4 December 2014
Songpan	1	October	2011	S. Francis <i>in litt.</i> 4 December 2014
Yunnan				
Potatso NP	1	?	2014	www.ebird.org
Tiger Leaping Gorge	1	October	2006	www.ebird.org
Zhongdian	4	October	2008	Zhong Jia <i>in litt.</i> 17 November 2014
Zhejiang				
?	25	February	2014	www.ebird.org
Chengsi	26	November	2007	http://birdtalker.net/report/userinfo.asp?id=819
Deqing	30	March	2013	http://birdtalker.net/report/userinfo.asp?id=5207
Lin'an	2	February	2007	China Ornithological Society (2008)
Lin'an	4	April	2009	http://birdtalker.net/report/userinfo.asp?id=3171
Ling Shan Xian	2	February	2006	http://birdtalker.net/report/userinfo.asp?id=8
Ling Shan Xian	1	March	2008	http://birdtalker.net/report/userinfo.asp?id=10
Shengsi	5	October	2004	China Ornithological Society (2005)
Shengsi	26	November	2007	China Ornithological Society (2008)
Wenzhou	3	February	2005	http://birdtalker.net/report/userinfo.asp?id=959
Wuhu	1	December	2010	J. Hopkins <i>in litt.</i> 2 December 2014
Wushaling	25	?	2014	www.ebird.org
Zhejiang	1	May	2003	China Ornithological Society (2004)
Taiwan				
Kinmen	up to 8	40 observations	2004-14	www.ebird.org
Vietnam				
Between Quang Uyen & Trung Khanh	3	April	2009	J. Eames <i>in litt.</i> 1 December 2014
Tra Linh	About 120	November	2011	BirdLife International (2016)
Between Trung Khanh & Thanh Hen Lake	20	April	2009	J. Eames <i>in litt.</i> 1 December 2014
Trung Khanh District	3 pairs	December	2013	J. Eames <i>in litt.</i> 1 December 2014

Notes:

* site falls within the Dabie Shan

** maximum count generated from a communal roost count

? data/information unavailable

Hong Kong Birdwatching Society observers:

John Allcock, Ruy & Karen Barretto, Abdel Bizid, Lester Bull, M. L. Chalmers, S. M. Chan, Sonny Chan, Beetle Cheng, Tommy Cheung, William Cheng, Gary Chow, Chris Champion, Cheung Mok, Jose Alberto, Chima, Chung Yun Tak, Bart De Schutter, D. A. Diskin, G. J. Carey, John Clough, Ho Wai Chun, Ivan Tse, A. J. Hardacre, John & Jemi Holmes, Tony Hung, James Lambert, Katherine Leung, Kwan Po Kuen, Kwok Pun Chau John, Lai Nga-ye, Lo Chun Fai, Lee Kwok Shing, Richard Lewthwaite, M. Lisse, M. D. Williams, Ms. Jimmy Chim & Mr. William Tsui, Nora Hung, Mike Kilburn, Roger Lee, George Harry/Nenita Miller, Roger Musgrove, Alan Pong, Bena Smith, Bond Shum, S. H. So, Sung Yik Hei, S. L. Tai, Graham Talbot, Dylan Thomas, Geoff Welch, Captain Wong, Michelle & Peter Wong, Tse Wai Lun & Ying Hak King, Yeung Lee Ki, Vicky, Ying Hak King and Yu Yat-Tung.